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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,363	02/19/2004	Carole A. Lepilleur	200CT015E	5628
37535	7590	03/01/2006	EXAMINER	
NOVEON IP HOLDINGS CORP. 9911 BRECKSVILLE ROAD CLEVELAND, OH 44141-3247			TUCKER, ZACHARY C	
			ART UNIT	PAPER NUMBER
			1624	

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/782,363	<b>Applicant(s)</b> LEPILLEUR ET AL.	
	<b>Examiner</b> Zachary C. Tucker	<b>Art Unit</b> 1624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 10-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>19Feb, 13May04, 06Jun05</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

A Requirement for Restriction letter, in the instant application, was mailed 25 November 2005. Applicant's election of Group I in the reply thereto filed on 22 December 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election **without** traverse (MPEP § 818.03(a)).

Claim 6, since it does not reference the vinyl ester toughener wherein the toughener polymer is of the formula X<sup>1</sup>, does not pertain to the subject matter of Group I, as was set forth in the Requirement for Restriction. Inclusion of claim 6 in Group I of the Restriction Requirement, therefore, was erroneous. Instead, claim 6 (in part) is actually part of Groups II and III.

Claims 6 and 10-37 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention.

Claims 1-5 and 7-9 in part, only insofar as those claims refer to Formula X<sup>1</sup> containing vinyl ester tougheners, are the subject of the elected Group for examination.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 7-9 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As is apparent from a reading of the above statute, 35 U.S.C. 101, an invention that is both a product and a process is not a

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patentable class of invention. Both a product and a process are recited in claims 7-9 – a vinyl ester toughener and an esterification reaction. Since each one of a process, machine, manufacture or composition of matter are recited in the alternative in the language of 35 U.S.C. 101, subject matter set forth as being a product and at the same time a process is not embraced by that language. See MPEP 2173.05(p).

An indefiniteness rejection of claims 7-9 is also set forth hereinbelow. In light of the combination of non-statutory nature of claims 7-9 and the indefiniteness thereby posed, those claims have not been further examined on the merits with respect to the prior art.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5 and 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Several points of indefiniteness arise in claims 1-5 and 7-9; each will be addressed in a list appearing below. Any claim 1-5 or 7-9 that is not specifically addressed in the following sentences is included in this rejection because all of the claims under examination at least depend from an indefinite base claim either directly or indirectly, and thus are indefinite by incorporation of the indefinite base claim.

#### **Claim 1:**

- Lines 2 and 3 of instant claim 1 specify that the vinyl ester toughener is the reaction product of a toughener polymer or copolymer and an unsaturated

monocarboxylic acid, while the 4<sup>th</sup> and 5<sup>th</sup> lines of the claim refer to “said unsaturated monoacid.” No previous recitation of an “unsaturated monoacid” is in claim 1, so that claim element lacks antecedent basis within the claim. It has been presumed that “said unsaturated monoacid” refers to the previously recited unsaturated monocarboxylic acid. Correction is required in order to make the scope of the claim clear because “unsaturated monoacid” is actually broader in scope than “unsaturated monocarboxylic acid.”

- The limitation “toughener,” which is present in claim 1 (and also in all of the other claims under examination), is indefinite, as it is a relative term. The term “toughener” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree of toughness imparted by the toughener polymer, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. If all polymers of Formula X<sup>I</sup> are toughener polymers, then the recitation of “toughener” is superfluous and should be removed to eliminate ambiguity. If only some substances embraced by Formula X<sup>I</sup> actually function as toughener polymers, then the claim is indefinite because it is unclear as to exactly to which ones the claim limitation “toughener” refers. In the examination of claim 1, it has been presumed that any substance that meets the claim limitations set forth in the body of the claim is in fact a vinyl ester toughener according to the invention, as described in the preamble. A rejection under 35 U.S.C. 102(b) has been set forth in this Office action bearing this in mind. All references to “toughener(s)” should be removed from the claims.

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- “EPOXY” in Formula X<sup>I</sup>, in claim 1, is not defined. Claim 1 has been examined as though “EPOXY” were defined as in instant claim 3.
- The recitation “where m and n, independently, is a repeat unit from about 5 to about 1,000.” presents logical problems in the interpretation because m and n are subscripts in the structural formula indicating the number of “(polymer)” moieties in the toughener polymer molecule. The variables m and n may only be assigned a number, not a structural identity. Claim 1 has been examined as though m and n were numerical values only.
- “m and n is a repeat unit of from about 5 to about 1,000” is indefinite claim language because the conjunction “and” between the two variables, recited before the verb “is,” implies that the *sum* of m and n is what is equal to the numerical value specified. It is unclear whether each one of m or n is equal to a number in the range specified or if the sum of the two is what is selected from the range specified. The word “independently” does not remedy the discrepancy because “independently” could imply that each numerical value, with respect to the sum of m and n is independent of the other; it does not necessarily require that m and n are taken separately to represent a numerical value from the specified range. In the examination of claim 1, it has been presumed that applicants intended to set forth the values of m and n separately, such as would be the case if the claim language read, “m and n are each equal to from about 5 to about 1,000.”

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- Because only the identities of  $\underline{m}$  and  $\underline{n}$  have been specified, the identity of “(polymer)” is not defined in claim 1. Claim 1 has been examined on the merits as though the identity of “(polymer)” was as is set forth in instant claim 2.
- In the definition of variables  $R^1$  and  $R^2$  in formula  $X^1$ , the phrase “or combinations thereof” appears in a Markush group from which the substituent  $R^1$  or  $R^2$  is chosen. A single substituent in a molecular structure cannot exist as a combination of substituents. The “or combinations thereof” language is permissible and logical when it describes what a polymeric material is derived from, since it is possible to make polymers from a combination of different substances, so the “or combinations thereof” clause is not objected to when present in a Markush group describing the structural elements “(polymer)” and EPOXY, as is the case in instant claims 2-5. Claim 1 has been examined as though “or combinations thereof” were not part of the Markush group of identities for  $R^1$  and  $R^2$ .
- Improper Markush language is recited in the definition of the “said one or more substituents.” Proper Markush groups are set forth as “selected from the group consisting of \_\_\_, \_\_\_ and \_\_\_.” Instant claim 1 recites that the Markush group of “at least one substituent” *comprises* the recited options, which is nonlimiting. Additionally, in the Markush group of “one or more substituents” includes “a halogen group.” A halogen *group* is not understood as a term of art. Halogens in organic compounds exist as monovalent atoms bonded to the molecule. So, that limitation in claim 1 should be rewritten as “a halogen” or “a halogen atom.”

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Claim 1 has been examined as though proper Markush language was present; correction is required.

- It is not clear whether the phrase “said one or more substituents” refers only to the substituents referred to as optional on the alkyl group identity of  $R^1$  and  $R^2$ , (which is actually first set forth as “1 or more substituents,” as opposed to the former, where the number “one” is spelled out – the numeral or the word should be chosen for both for the sake of consistency) or if the definition of “said one or more substituents” also defines the latter recitation of “having from 1 to about 6 substituents,” which is optional on the “at least one aryl” identity of  $R^1$  and  $R^2$  as well. If not, then the substituents referred to on the aryl group identity for  $R^1$  and  $R^2$  are undefined, rendering the claim indefinite in that respect. In the examination of claim 1, it has been presumed that the Markush group of substituents set forth as “said one or more substituents” actually refers to the substituents on the alkyl group identity of  $R^1$  and  $R^2$  as well as the aryl group identity of  $R^1$  and  $R^2$ . Correction of the claim so that consistent language with respect to the identity of the optional substituents in  $R^1$  and  $R^2$  is recited therein is required.

Claim 2:

- “m and n is a repeat unit of from about 7 to about 150” is indefinite claim language because the conjunction “and” recited between the two variables, before “is,” implies that the *sum* of m and n is what is equal to the numerical value specified. It is unclear whether each one of m or n is equal to a number in the range specified or if the sum of the two is what is selected from the range



specified. The word “independently” does not remedy the discrepancy because “independently” could imply that each numerical value, with respect to the sum of m and n is independent of the other; it does not necessarily require that m and n are taken separately to represent a numerical value from the specified range. In the examination of claim 2, it has been presumed that applicants intended to set forth the values of m and n separately, such as would be the case if the claim language read, “m and n are each equal to from about 7 to about 150.”

Claim 3:

- Claim 3 recites numerous types of compounds from which the EPOXY end groups can have been derived which compounds do not comprise any epoxide groups. The first listed is polyhydric phenol polyether alcohols, which covers hundreds, if not thousands of distinct compounds which do not include an epoxide group. The examiner is aware that applicant may be his own lexicographer, but because “EPOXY” is undefined in the base claim (claim 1), and a claim dependent therefrom recites a non-epoxide group containing substance as that from which the “EPOXY” group moiety is derived, it is evident that “EPOXY” need not even comprise an epoxide group, contrary to what one would assume to be the least requirement for the identity of a structural element denoted “EPOXY.” In the examination of claim 3, non-epoxy compounds (polyhydric phenol polyether alcohols, that is) have not been considered as substances from which the groups “EPOXY” can have been derived.

Claim 5:

- “about 1 to about 2,” which describes the number of terminal EPOXY groups in formula  $X^I$  is indefinite. Does “about 1” include zero? Does “about 2” include 1? Since claim 5 depends from claim 1, in which the number of terminal EPOXY groups shown in formula  $X^I$  is two – no other configurations are permitted. Any number of terminal EPOXY groups other than two is not possible and is contradictory to claim 1. Claim 5 provides for numbers of EPOXY groups other than two. The numerical range from 1 to 2 which is specified in instant claim 5 is furthermore so small that the word “about” introduces a degree of uncertainty unacceptable with respect to the claims of a patent, in light of the fact that the number of terminal EPOXY groups can only be an integer value – fractions of an EPOXY terminal group are not possible in the molecular structures embraced by formula  $X^I$ . Additionally, the structure depicted in claim 5, of the compound from which EPOXY in claim 1, formula  $X^I$  is derived, includes epoxide rings. It is not clear from claim 5 whether these rings are intact and present in formula  $X^I$ , or if those rings are reacted and are therefore not present in compounds of the formula  $X^I$ . In the examination of claim 5, it has been presumed that the EPOXY groups cannot be less than or more than two, and that the toughener polymer of the formula  $X^I$  must comprise some intact epoxide rings in the EPOXY groups of the structural formula.

Claims 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In addition to being indefinite for depending from an indefinite base claim, claims 7-9 are further indefinite for recitation of an esterification reaction, for which said base claims provide no antecedent basis. No esterification reaction is specified in any of claims 1-5. Additionally, claims 7-9 are indefinite because it is not clear whether those claims are drawn to a process (an esterification reaction) or a product, as both are indeed recited therein.

As stated above in the section headed "Claim Rejections - 35 USC § 101," claims 7-9 have not been further examined on the merits in this Office action.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3,658,741 (Knutson and Dench). Knutson and Dench disclose a continuous polymerization of ethylene and various comonomers under conditions such that homogeneous copolymers are produced (col. 1, lines 30-42). Products made by reaction of ethylene with acrylic acid, methacrylic acid and some derivatives of the acrylic acids are disclosed in the Examples section of Knutson and Dunch (col. 9-11). Because the polymerization is continuous, the products made in Knutson and Dunch's examples are the reaction product of a copolymer (ethylene/acrylic acid in the case of examples 1 and 2) with an unsaturated carboxylic acid, because new ethylene and acrylic acid units are reacted with the copolymer of ethylene/acrylic acid that formed

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“EPOXY” group of Formula X<sup>I</sup>. Knutson and Dunch disclose the copolymer-based embodiment of claim 1, and these claim limitations do not affect the scope of that embodiment.

***Allowable Subject Matter***

Claims 1-5 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, second paragraph, and the rejection under 35 U.S.C. 102(b), set forth in this Office action.

A reaction product of a polymer of the Formula X<sup>I</sup> and an unsaturated monocarboxylic acid is not known from or suggested by the prior art. Although trithiocarbonate compounds are known in the art as sulfur releasers in polymers or as polymer stabilizers, trithiocarbonate compounds as structural elements of polymers, in the manner set forth in instant claims 1-5, are not.

Instant claim 1 states that the vinyl ester toughener is either the reaction product of a polymer of the formula X<sup>I</sup> (or H<sup>I</sup>, F<sup>I</sup>, G<sup>I</sup> which are non-elected) and an unsaturated carboxylic acid, or the reaction product of a copolymer and an unsaturated carboxylic acid. Only the identity of the (“toughener”) polymer is specified with a particular molecular formula; the copolymer is, in the broadest reasonable interpretation, *any* copolymer, with respect to the elected invention under examination, though the copolymer’s identity might be specified with molecular formulae with respect to the *non-elected* subject matter in the instant application. For this reason, the rejection under 35 U.S.C. 102(b) is set forth. In its present form, claim 1 reads on the reaction product of an unsaturated carboxylic acid and a copolymer of any type. A simple correction to

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claim 1, wherein the phrase "or copolymer" is inserted after "said" in line six of that claim would overcome the rejection based on Knutson and Dench.

As indicative of the state of the art with respect to trithiocarbonates in the polymer arts, the examiner would cite:

US 2,858,292 (Swart et al), which discloses alkyl, alkenyl, arylalkyl and aryl-alkenyl trithiocarbonates useful as stabilizers for polymers (col. 2, lines 20-50). Formula XI embraces None of Swart et al's trithiocarbonates.

US 5,604,084 (Grzeskowiak et al) discloses sulfur-releasing polymers for use as additives in photographic films. A copolymer of 1,4-butanediol and *bis*-carboxymethyltrithiocarbonate is disclosed in Example 7 (col. 13). No trithiocarbonate embraced by Formula X<sup>I</sup> is disclosed in Grzeskowiak et al.

Several examples of dithiocarbonates and dithiocarbamates as chain transfer agents in "living polymerization" processes are disclosed in references cited in applicants' Information Disclosure Statements filed 19 February and 6 June 2004.

#### ***Information Disclosure Statements***

Applicants' submission of Information Disclosure Statements (IDS) filed 19 February 2004, 13 May 2004 and 6 June 2005 have been considered, and the forms PTO 1449 accompanying those statements are signed and initialed, enclosed with this letter. The number cited on the PTO 1449 form accompanying the IDS filed 6 June 2005, in the section headed "U.S. PATENT DOCUMENTS," is not that of an actual U.S. patent, so that citation was lined through.

#### ***Conclusion***

Any inquiry concerning this communication should be directed to Zachary Tucker whose telephone number is (571) 272-0677. The examiner can normally be reached Tuesday-Thursday from 8:00am to 4:30pm or Monday from 6:00am to 1:30pm. If

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Attempts to reach the examiner are unsuccessful, contact the examiner's supervisor, James O. Wilson, at (571) 272-0661.

The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.

zt

A handwritten signature in black ink, appearing to be 'zt' followed by a stylized flourish.